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Abstract:

During tenure of the grant we have made tremendous strides in finding active ligands for the mechanosensitive channels. We developed a simple screen for the toxins based upon hypotonic swelling of GH3 clonal neurons which produced increases in internal Ca^{2+} levels that could be measured using Fura-2. Addition of active venoms would lead to a decrease in Ca^{2+} levels following swelling. Screening a variety of spider and scorpion venoms, we found that none of the scorpions tested (≈ 12) but one of the ≈ 8 spiders tested was able to block volume activated Ca^{2+} uptake. The raw venom also blocked stretch activated ion channels in *Xenopus* oocytes, chick heart cells and GH3 cells, and whole cell mechanical currents in chick heart cells.

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Chen, Y., S.M. Simasko, J. Niggel, W.J. Sigurdson, and F. Sachs (1996) Ca^{2+} uptake in GH3 cells during hypotonic swelling: the sensory role of stretch-activated ion channels. *Am.J.Physiol.* 270:C1790-C1798.

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Hu, H. and F. Sachs (1994a) Effects of mechanical stimulation on embryonic chick heart cells. *Biophys.J.* 66:A170(Abstract)

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Izu, Y.C., S. Simasko, and F. Sachs (1993) Calcium pathways involved in the hypotonicity-induced calcium increase in GH3 cells. *FASEB Journal* 7(4):A891(Abtract)

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Izu, Y.C. (1994) A study of the sensory mechanism of cell volume regulation. PhD. Thesis, Biophysical Sciences, SUNY, Buffalo, NY.

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Y. Chen-Izu, 1994, SUNY Biophysics.

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